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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/660,861	09/12/2003	Robert J. Drost	SUN03-0316	2167

57960 7590 06/23/2011

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EXAMINER

WONG, ALAN

ART UNIT	PAPER NUMBER
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2817

MAIL DATE	DELIVERY MODE
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06/23/2011

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/660,861

Applicant(s)

DROST, ROBERT J.

Examiner

ALAN WONG

Art Unit

2817

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5,6,9,10,12,14,15,18,19,21,23,24 and 27 is/are rejected.
- 7) ☒ Claim(s) 2,4,7,8,11,13,16,17,20,22,25 and 26 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because in Figs. 3, 5-7, a differential pair is shown to be connected with a solid line even though they are not physically connected. As a suggestion for Applicant to easily identify the differential pairs on the figures, Applicant may use dash line between or encircle the differential pair and indicate explicitly on the figure that "dash line indicates a differential pair" and the related specification should be amended accordingly. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claims 2, 11, 12, 20 are objected to because of the following informalities:
3. For claims 2, 11, 20, for consistency, "first component of the fourth pair" should be rephrased as --second component of the fourth pair-- and "second component of the fourth pair" should be rephrased as -- first component of the fourth pair-- to follow the convention of the first components denote the positive parts and the second components denote the negative parts (e.g. see Fig. 5, K, H, E, I for first, second, third, fourth pairs, respectively).
4. Also for claims 2, 11, 20, the directions of "northeast", "north", "south", etc. are not defined in the claim. Applicant needs to either explicitly define the directions in the claim or choose some other method to claim the orientation.
5. Claim 12 is objected because claim 12 depends on itself and appears should correctly be depended on claim 10.
6. Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 5, 6, 9, 10, 14, 15, 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Thornton US 5,966,056.

9. Thornton discloses an apparatus for transferring differential signal (Fig. 1) and used in a method thereof, comprising:

a sender and a receiver (cable 108 is a medium for connecting devices, thus inherently there is sender and receiver at the end of the cables);

ports (the ends of cable 108, specifically lines 110a, 110b, 114a, 114b would be connecting to the sender and receiver devices, and they are viewed as "ports", which are connection points to other elements);

transmitting a number of differential signals (A+, A-; B+, B-) through parallel ports (A and B are transferring together as shown in Fig. 1, thus parallel);

the parallel ports are organized in a 2D grid (as seen in Fig. 1, the ends of the cable 108 would naturally have the same 2D grid);

each differential signals is through a first and second ports that carry complementary positive and negative components of the differential signals (A+, A-, B+, B-);

the first and second ports of a differential pair are diagonally adjacent to each other in the 2D grid (see Fig. 1, e.g. A+ and A-);

inherently whereby because signals in the first and second ports transition in opposite directions, coupling noise is cancelled on a neighboring port (B-) that is horizontally adjacent to the first port (A+) and vertically adjacent to the second port (A-), and wherein a transition on the neighboring port couples equally to the first and second ports and is consequently rejected as common-mode noise by a corresponding

differential receiver (Col. 2 lines 51-53: the signals are isolated from one another due to the arrangement, thus have no effect on each other, hence providing noise rejection);

ports are conductive pads (since the ends of the cable 108 are the ports for the sender and receivers, that port connections would necessarily be “connective”; and the port connections are the area of connections, which are considered “pads”);

the conductive pads (ends of cable 108) are coupled together through wires (110a, 110b, 114a, 114b) which create conductive paths between the ports;

the ports are round shaped (circle, see Fig. 1).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 19, 23, 24, 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Levy US 7,802,049 in view of Thornton US 5,966,056.

12. Levy discloses a computing device (Fig. 1, aka “computer system”) comprising: processor (102), and memory (106).

13. Levy does not disclose a set of parallel ports in a 2D grid, differential signals with corresponding ports adjacent diagonally, noise rejection, ports that are conductive pads, conductive pads that are coupled together through wires, and round shaped ports.

14. Thornton disclose parallel ports in 2D grid, differential signals with corresponding ports adjacent diagonally, noise rejection, ports are conductive pads, conductive pads are coupled together through wires, and round shaped ports as discussed in the preceding rejection above.

15. At the time of the invention, it would have been obvious to one of ordinary skill in the art to have replace the connections between components in Levy's computer system with Thornton's connection of 2D grid because differential signals can provide the benefit of signals transferred with isolation from each other as taught by Thornton (Thornton: Col. 2 lines 51-53).

16. Claims 3, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thornton US 5,966,056 and Harvey US 6,876,088 taken together.

17. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Levy US 7,802,049 in view of Thornton US 5,966,056 as applied to claim 19 and Harvey US 6,876,088, taken together.

18. Thornton or the Levy/Thornton combination discloses the invention as discussed above including the 2D grid for connection (Thornton: Fig. 1) but does not disclose sender or receiver ports on or near surface of a first or second semiconductor chip respectively; and the chips are positioned face to face as that the ports overlap to facilitate communications between the chips.

19. Harvey discloses first and second chip dies (Fig. 6 items 25a, 25b) with ports on surfaces thereof and connected face to face (though solder 5 and circuit layer 1), the

ports overlap to facilitate communication (see Fig. 6) with interconnection (circuit layer 1) but does not disclose the 2D grid for connection.

20. At the time of the invention, it would have been obvious to have replaced the interconnection of Harvey with the art recognized equivalent 2D grid connection of Thornton or Levy/Thornton combination because the 2D grid connection would provided the benefit of respective signals carried thereon that are electrically isolated from one another as suggested by Thornton (Col. 2 lines 51-53) and the overlap of chips is a well known way of arrangement to provide consistent short length interconnection as suggested by Harvey (Col. 1 lines 28-30 42-45).

Allowable Subject Matter

21. Claims 2, 4, 7, 8, 11, 13, 16, 17, 20, 22, 25, 26 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

22. The following is a statement of reasons for the indication of allowable subject matter:

23. For claims 2, 11, 20, the closest reference Thornton does not disclose four differential pairs in the claimed grid arrangement.

24. For claims 4, 13, 22, the closest reference Thornton does not disclose ports that are capacitive plates positioned so that voltage changes on sender plates cause voltage changes on corresponding receiver plates through capacitive coupling.

25. For claims 7, 16, 25, the closest reference Thornton does not disclose ports that are wire loops positioned so that current flow in sender loops causes current to flow in corresponding receiver loops through inductive coupling.

26. For claims 8, 17, 26, the closest reference Thornton does not disclose sender ports that are optical signal generators; receiver ports that are photo-detectors; and wherein the sender ports and receiver ports are positioned so that optical signals can be transmitted from sender ports to corresponding receiver ports.

Conclusion

27. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Song US 6,891,447 disclose capacitive coupling; Shibata et al. US 6,809,609 disclose inductive coupling; Cao US 2005/0135813 and Mokhtari US 2004/0166817 disclose optical transmitter/receiver.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALAN WONG whose telephone number is (571)272-3238. The examiner can normally be reached on Mon-Thurs 10am-7:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

**/BENNY LEE/
PRIMARY EXAMINER
ART UNIT 2817**

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